

## REMARKS

The present application has been reviewed in light of the Office Action dated April 1, 2009. Claims 1 and 4 are presented for examination and have been amended to define aspects of Applicant's invention more clearly. Favorable reconsideration is requested.

The Office Action states that Claim 1 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,071,297 (Leitz et al.) in view of U.S. Patent No. 6,426,773 (Suzuki); and that Claim 4 is rejected under § 103(a) as being unpatentable over Leitz et al. in view of Suzuki, and further in view of U.S. Patent No. 5,760,852 (Wu et al.). For at least the reasons presented below, Applicant submits that independent Claim 1 and dependent Claim 4 are patentably distinct from the cited references.

As an initial matter, Applicant thanks the Examiner for taking the time to discuss the present application with Applicant's undersigned representative in a telephone call on May 15, 2009. The claim amendments and the following remarks are consistent with the discussion in the telephone call.

Claim 1 is directed to an image pickup apparatus with a plurality of pixels and an output unit. The output unit receives a first electric signal and a second electric signal from each of the plurality of pixels and detects and outputs a phase difference between corresponding first and second electric signals from each of the plurality of pixels.

Each pixel includes first and second photoelectric conversion portions arranged therein such that:

-- an interval separates the first and second photoelectric conversion portions,

-- the first photoelectric conversion portion has a first sensitivity distribution for carriers generated in a first region corresponding to the first photoelectric conversion portion and the interval,

-- the first sensitivity distribution producing a first image component on an exit pupil of the image pickup apparatus,

-- the second photoelectric conversion portion has a second sensitivity distribution for carriers generated in a second region corresponding to the second photoelectric conversion portion and the interval,

-- the second sensitivity distribution producing a second image component on the exit pupil,

-- each sensitivity distribution is a distribution of signal intensity as a function of distance, and

-- the first and second sensitivity distributions partially overlap with each other, resulting in a partial overlap of the first and second image components with each other.

It is alleged in the Office Action that Leitz et al. discloses all the features of Claim 1, except for the feature of “a sensitivity distribution of the first sensitive area and a sensitivity distribution of the second sensitive area partially [overlapping] in an area interposed between the two photoelectric conversion units of the pixel.” See Office Action at page 3, lines 13-15. The Office Action then alleges that Suzuki discloses such a feature.

According to our understanding, Suzuki relates to color processing using color filters. It is noted in the Office Action that Fig. 11 of Suzuki teaches that “sensitivity distributions of blue, green and red pixels partially overlap.” See Office Action at page 3, lines

17-18. Applicant respectfully submits that the term “sensitivity distribution” has not been clearly construed, and the amendments to Claim 1 presented herein clarify the meaning of this term with respect to the claimed subject matter. Applicant further notes that the amendments to Claim 1 were discussed in the May 15th telephone call and were found by the Examiner to be sufficiently clear to distinguish over Suzuki.

More specifically, as explained in the May 15th telephone call, the phrase “sensitivity distribution,” as used in Claim 1, is not a sensitivity of a color filter, but instead is a sensitivity of a photoelectric conversion unit to picking up carriers. Thus, when the interval or distance between two photoelectric conversion units is large, their sensitivity distributions do not overlap, thus causing a gap to appear in a virtual image formed by these photoelectric conversion units on an exit pupil. Suzuki is not understood to have anything to do with such a phenomenon. To more clearly present this point, Claim 1 has been amended to specify that “an interval separates the first and second photoelectric conversion portions, the first photoelectric conversion portion has a first sensitivity distribution for carriers generated in a first region corresponding to the first photoelectric conversion portion and the interval, the first sensitivity distribution producing a first image component on an exit pupil of the image pickup apparatus, the second photoelectric conversion portion has a second sensitivity distribution for carriers generated in a second region corresponding to the second photoelectric conversion portion and the interval, the second sensitivity distribution producing a second image component on the exit pupil, each sensitivity distribution is a distribution of signal intensity as a function of distance, and the first and second sensitivity distributions partially overlap with each other, resulting in a partial overlap of the first and second image components with each other.”

It is respectfully submitted that neither Leitz et al. nor Suzuki discloses or suggests an image pickup apparatus having pixels with photoelectric conversion portions as claimed in Claim 1. Accordingly, Applicant submits that Claim 1 is patentable over the cited references, and respectfully requests withdrawal of the rejection under 35 U.S.C. § 103(a).

Claim 4 depends from Claim 1 and is submitted to be patentable for at least the reasons discussed above. However, because each dependent claim also is deemed to define an additional aspect of the invention, individual reconsideration of Claim 4 on its own merits is respectfully requested.

Claims 2, 3, and 5-7 depend from Claim 1, which is generic to all the claims remaining in the present application. Because Claim 1 is believed to be allowable, rejoinder of Claims 2, 3, and 5-7 in the present application is believed proper and is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and an early passage to issue of the present application.

No petition to extend the time for response to the Office Action is deemed necessary for this Amendment. If, however, such a petition is required to make this Amendment timely filed, then this paper should be considered such a petition and the Commissioner is authorized to charge the requisite petition fee to Deposit Account 50-3939.

Applicant's undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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